Remarks

The application has been reviewed in light of the Official Action mailed August 25, 2004. By the foregoing amendments, the drawings, specification, and claims have been amended. No new matter is introduced by the amendments.

The Examiner has objected to the drawings because of failure to show every features of the invention specified in the claims. In particular, the Examiner has pointed out that the features of the "one or more brake discs", "the fixed caliper", and "bearing means" are not shown in the drawings. By the foregoing amendments, Figure 4 has been introduced. Supports for this amendment can be found throughout the specification, claims, and drawings of the original application. In addition, one of ordinary skill in the art may easily understand and envision the construction or arrangement of particular features shown in Figure 4 from the specification, claims, and drawings of the original application.

The Examiner has rejected claims 1-9 under 35 U.S.C. 103(a) as being unpatentable over either Dagh et al. (WO 93/14947) or Heuberger et al. (DE 19642166A1) in view of Casey (US Pat. No. 4,844,206).

As independent claim 1 specifically recites, claims 1-9 of the invention each require among other limitations: that the disc brake has a fixed caliper and one or more brake discs which are received moveable in axial direction on the sleeve; that the sleeve has a groove with its main orientation being parallel with the outer periphery of the sleeve; that the sleeve forms an integrated sleeve and hub; that the sleeve is generally straight and parallel with the main extend of the wheel axle; and that the sleeve allows a brake disc to be slid off or slid onto the sleeve.

In the Drawings

Please add a new drawing FIG. 4 as enclosed herewith. FIG. 4 shows the features of the invention that were described in the specification and claims as originally filed.

Neither Dagh et al.(WO 93/14947) nor Heuberger et al. (DE 19642166A1) shows or teaches a disc brake having a fixed caliper and one or more brake discs received moveable in axial direction on the sleeve. The disc (8) of Dagh et al. and the disc (1) of Heuberger et al. are fixed in the axial direction on the sleeve or hub. There are substantial differences between the disc brakes having a fixed caliper and sliding (floating) brake discs, and the disc brakes having a sliding (floating) caliper and fixed brake discs. For example, one difference is the way the brake discs are received on a sleeve or the like. A fixed disc is mounted in a different way than a sliding disc.

Moreover, neither Dagh et al. nor Heuberger et al. shows or teaches the sleeve having a generally straight outer periphery which is parallel with the main extent of the wheel axle. As shown in FIG. 1 of Dagh et al., the wheel hub (6) of the Dagh et al. device has a generally funnel-like (i.e., non-straight) outer periphery with the outer end extending in a radial direction for fixing to the wheel flange with bolts. As shown in FIGS. 1 and 2 of Heuberger et al., the sleeve (2) of the Heuberger et al. device has a generally steped or taped outer periphery having the disc (1) fixed thereon. In addition, neither the wheel hub (6) of Dagh er al. nor the sleeve (2) with the roller bearing (Wälzlager) (5) of Heuberger et al. can be compared with the integrated sleeve and hub of the invention.

Furthermore, the problems to be solved by the two citations are substantially different from that of the present invention. The problem solved by Dagh et al. and Heuberger et al. is to reduce thermal stress for a brake disc integrated with or fixed to the hub. However, the problems to be solved by the present invention are to reduce the number of parts used in mounting a brake disc, facilitate maintenance and replacement of the discs, and to protect, in particular, the bearing means against overheating. For instance, having an integrated sleeve 2 with a generally straight outer periphery, the brake discs 14 slidably positioned on the sleeve 2 can be easily replaced from the front

side of the wheel by unscrewing the bolts 3, removing the wheel with the wheel flange 1, and then removing the discs 14 and replacing with new ones. See the last paragraph of the detailed description along with FIGS. 1 and 4 of the present application. In contrast, neither Dagh et al. nor Heuberger et al. contemplates such maintenance concerns. As such, the problems to be solved are not the same nor similar. Thus, it cannot be obvious for a person skilled in the art to use Dagh et al. and Heuberger et al. in order to solve the different technical problems of the present invention.

In addition, it is respectfully submitted that Dagh et al. actually *teaches away* this important maintenance feature of the present invention. As shown in FIG. 1 of Dagh et al., because the wheel hub (6) of the Dagh et al. device has a radially enlarged outer periphery and a lock ring (25) to fix the disc (8) on the wheel hub (6), it is impossible to remove the disc (8) from the font side of the wheel after detaching the bolts connecting the wheel hub (6) to the wheel flange because the disc (8) cannot be slidably removed toward the front side due to the enlarged outer periphery of the wheel hub (6) blocking the axial movement. In order to replace the disc (8), the hub and disc assembly must first be disassembled as a unit. This requires a cumbersome and time-consuming maintenance work to replace the discs.

On the other hand, Casey (US Pat. No. 4,844,206) shows no groove, the main orientation of which is parallel with the outer periphery of the sleeve. Moreover, Casey does not disclose or teach any sleeve forming an integrated sleeve and hub. Further, Casey does not disclose or teach the sleeve is generally straight and parallel with the main extend of the wheel axle. Unlike the claimed invention, the Casey device includes complicated sleeve and hub components such as an L-shaped (i.e., non-straight) disc hub (22) with cylindrical wall (24) and radially extending wall (26), etc. This composite construction requires a time-consuming maintenance work to replace the discs.

There are substantial differences between the disc brakes having a fixed caliper and sliding (floating) brake discs of the present invention, and the disc brakes having a sliding (floating) caliper and fixed brake discs as disclosed in the cited references. For example, one difference is the way the brake discs are received on a sleeve or the like. A fixed disc is mounted in a different way than a sliding disc. Thus, it is not obvious to combine the teachings of the different types of the disc brakes. There is not any kind of suggestions in Dagh et al., Heuberger et al., or Casey indicating that such a combination or modification is contemplated nor is it obvious how such a combination would look like. It is for instance not obvious that the sleeve would be generally straight or that a groove would be formed in the sleeve, which groove is parallel with the wheel axle. As discussed above, Dagh et al. and Casey actually teach away such a combination or modification to reach the present invention as claimed.

Accordingly, in view of the foregoing, it is respectfully submitted that claims 1-9 of the invention are patentable over the combination of Dagh et al. , Heuberger et al., and Casey.

The Examiner has further rejected claims 1-9 under 35 U.S.C. 103(a) as being unpatentable over Dagh et al. (US Pat. No. 5,507,367) or Bodin et al. (US Pat. No. 5,540,303) or Dagh et al. (US Pat. No. 5,568,846) or Dagh et al. (US Pat. No. 6,330,937) or Gotti et al. (US2004/50632A1) in view of Casey (US Pat. No. 4,844,206).

As is similar to Dagh et al.(WO 93/14947) and Heuberger et al. (DE 19642166A1) discussed above, each of the above-identified principal references fails to show or teach a disc brake having a fixed caliper and one or more brake discs received moveable in axial direction on the sleeve. The discs of such devices of reference are fixed in the axial direction on the sleeve or hub. There are substantial differences between the disc brakes having a fixed caliper and sliding (floating) brake discs, and the

disc brakes having a sliding (floating) caliper and fixed brake discs. For example, one difference is the way the brake discs are received on a sleeve or the like. A fixed disc is mounted in a different way than a sliding disc.

Moreover, each of the above-identified principal references fails to show or teach the sleeve having a generally straight outer periphery which is parallel with the main extent of the wheel axle. As shown in FIG. 1 of each of the principal references, the wheel hub of the referenced devices has a generally funnel-like (i.e., non-straight) outer periphery with the outer end extending in a radial direction for fixing to the wheel flange with bolts. None of the wheel hub of the referenced devices can be compared with the integrated sleeve and hub of the invention.

Furthermore, the problems to be solved by the two citations are substantially different from that of the present invention. The principal problem solved by each of the above-identified principal references is to reduce thermal stress for a brake disc integrated with or fixed to the hub. However, the problems to be solved by the present invention are to reduce the number of parts used in mounting a brake disc, facilitate maintenance and replacement of the discs, and to protect, in particular, the bearing means against overheating. For instance, having an integrated sleeve 2 with a generally straight outer periphery, the brake discs 14 slidably positioned on the sleeve 2 can be easily replaced from the front side of the wheel by unscrewing the bolts 3, removing the wheel with the wheel flange 1, and then removing the discs 14 and replacing with new ones. See the last paragraph of the detailed description along with FIGS. 1 and 4 of the present application. In contrast, none of the referenced disclosures contemplate such maintenance concerns. As such, the problems to be solved are not the same nor similar. Thus, it cannot be obvious for a person skilled in the art to use the referenced disclosures in order to solve the different technical problems of the present invention.

In addition, it is respectfully submitted that each of the above-identified principal references actually *teaches away* this important maintenance feature of the present invention. As shown in FIG. 1 of each of the referenced disclosures, because the wheel hub of the devices has a radially enlarged outer periphery and a locking mechanism to arrange the discs on the wheel hub, it is impossible to remove the disc from the font side of the wheel after detaching the bolts connecting the wheel hub to the wheel flange because the disc cannot be slidably removed toward the front side due to the enlarged outer periphery of the wheel hub which blocks the axial movement. In order to replace the disc, the hub and disc assembly must first be disassembled as a unit. This requires a cumbersome and time-consuming maintenance work to replace the discs.

On the other hand, Casey (US Pat. No. 4,844,206) shows no groove, the main orientation of which is parallel with the outer periphery of the sleeve. Moreover, Casey does not disclose or teach any sleeve forming an integrated sleeve and hub. Further, Casey does not disclose or teach the sleeve is generally straight and parallel with the main extend of the wheel axle. Unlike the claimed invention, the Casey device includes complicated sleeve and hub components such as an L-shaped (i.e., non-straight) disc hub (22) with cylindrical wall (24) and radially extending wall (26), etc. This composite construction requires a time-consuming maintenance work to replace the discs.

There are substantial differences between the disc brakes having a fixed caliper and sliding (floating) brake discs of the present invention, and the disc brakes having a sliding (floating) caliper and fixed brake discs as disclosed in the cited references. For example, one difference is the way the brake discs are received on a sleeve or the like. A fixed disc is mounted in a different way than a sliding disc. Thus, it is not obvious to combine the teachings of the different types of the disc brakes. There is not any kind of suggestions in any of the above-identified references indicating that such a combina-

tion or modification is contemplated nor is it obvious how such a combination would look like. It is for instance not obvious that the sleeve would be generally straight or that a groove would be formed in the sleeve, which groove is parallel with the wheel axle. As discussed above, each of the above-identified principal references and Casey actually teach away such a combination or modification to reach the present invention as claimed.

Accordingly, in view of the foregoing, it is respectfully submitted that claims 1-9 of the invention are patentable over the combination of Dagh et al. (US Pat. No. 5,507,367), Bodin et al. (US Pat. No. 5,540,303), Dagh et al. (US Pat. No. 5,568,846), Dagh et al. (US Pat. No. 6,330,937), Gotti et al. (US2004/50632A1) and Casey (US Pat. No. 4,844,206).

Accordingly, Applicant respectfully submits that all of the claims currently pending in this application (i.e., claims 1-9) are in condition for allowance. Reconsideration and early notice to that effect is earnestly requested.

Respectfully submitted,

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